

REMARKS

Amendments

The specification has been amended to provide updated serial number information at page 11. An obvious grammatical correction has also been carried out by amendment.

Claim 1 has been amended to specifically recite that the charge control adjuvant is present in the liquid toner composition in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations. Antecedent basis for this amendment is located in the specification at page 9, lines 2-6.

Claim Rejections – 35 USC § 102

Claims 1-3, 10-15, 17, 18, and 20 have been rejected under 35 U.S.C. 102(b) as being anticipated by deGraft-Johnson et al. in US Patent 5,232,811.

The present invention relates to liquid toner compositions comprising particles comprising amphipathic copolymers. The toner compositions as claimed comprise a plurality of negatively charged toner particles dispersed in the liquid carrier. Thus, the toner particles are already charged, i.e. already have a charge director (if necessary) associated with the toner particles. See page 28 of the present specification at lines 1-5.

The present invention describes providing an element to the toner composition in addition to the charge director (i.e. in addition to the component that provides a charge to the particle). This additional element is not present to charge the particle, but instead is present to provide exceptional charge control benefits to the toner composition. It has surprisingly been found that by addition of acid or base components to negatively charged toner particles as described in the present specification, bulk conductivity and preferably charge per mass are reduced during printing operations, providing superior imaging performance. As noted in the specification at page 8, line 28 to page 9, line 6, it is believed that the adjuvant as described in the specification and claims selectively coordinates with counterions in the toner composition, possibly including counterions previously associated with the charge directors that are associated with the toner particles. Surprisingly, the charge control adjuvant reduces the bulk conductivity of the liquid toner composition and preferably simultaneously reduces the charge per mass of the toner particles. This charge effect, both in bulk conductivity and preferably in charge per mass, is of

particular benefit during printing operations, providing an excellent charge balance in the toner system even as toner concentrations change as toner is depleted.

The effectiveness of use of an additional charge control adjuvant is demonstrated in the Examples beginning at page 36, wherein simple addition of charge control adjuvant to a conventional toner composition that was identified to be depleted resulted in reduction in conductivity and the ability to print to provide good optical density.

DeGraft-Johnson discloses a liquid toner composition comprising a carrier liquid, a dyed latex, a charge director, and mineral oil. DeGraft-Johnson does not teach or suggest the use of an additional element in the toner composition that is an acid or base, present in an amount to effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Because an element of the present claims is not disclosed in deGraft-Johnson, it is respectfully submitted that the present claims are not anticipated by the cited reference.

Claim Rejections – 35 USC § 103

Claims 1, 6-10, 14, and 16-20 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kosel in US Patent 3,753,760 in view of Gibson in US Patent 4,891,286 or Almog in US Patent 5,792,584.

Kosel discloses liquid toners prepared using amphipathic copolymers. Kosel does disclose the use of charge directors (in particular, metal soaps), as is conventional in the toner art. Kosel does not teach or suggest the use of an additional element in the toner composition that is an acid or base, present in an amount to effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Gibson discloses liquid toner dispersions in high-speed electrophotography wherein pigment charge homogeneity and mobility are stated to be improved by the addition of effective carrier liquid-insoluble monomeric organic acids to the toner solution. Gibson only discloses addition of acids to the negatively charged toner particles, and further this acid is added in the toner manufacturing process to the toner composition prior to addition of the conventional soy lecithin charge director. See column 7, lines 19 and 25. Thus, the organic acid as described in Gibson clearly is provided as an auxiliary charge director to increase the homogeneity and mobility of the charge of each particle, and is not present in an amount to effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Almog describes liquid toner compositions containing charge directors and in which the electrical properties of the charge directors are stabilized. The liquid compositions comprise (1) liquid hydrocarbon compatible with liquid toners for electrostatic imaging, (2) at least one charge director, and (3) at least one stabilizing component in an amount effective to stabilize the electrical properties of the at least one charge director, the stabilizing component being selected from solubilizable acids. These components are mixed with pigmented thermoplastic resin particles, and further liquid hydrocarbon such that the pigmented thermoplastic resin particles are micro-dispersed in the toner composition. See the Abstract. Thus, as in Gibson above, the stabilizing component acid is provided under processing conditions such that the stabilizing component acts as an auxiliary charge director to stabilize the unstable negative charge directors under high voltage conditions (see column 2, lines 20-21), and is not present in an amount to effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations. Note, for example, that under ordinary printing conditions (i.e., not under high voltage conditions), "Print quality was equal to that of toner without the additives." Column 5, lines 23-24.

The above references thus individually and in combination fail teach the use of a charge control adjuvant that is an acid or a base present in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Claims 1-5, 10-13, and 16-20 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kosel in US Patent 3,753,760 in view of *Handbook of Imaging Materials* to Diamond and Weiss (eds.) New York: Maracel-Dekker, Inc. (11/2001) pp. 242-247, 254-257.

Kosel discloses liquid toners prepared using amphipathic copolymers. Kosel does disclose the use of charge directors (in particular, metal soaps), as is conventional in the toner art. Kosel does not teach or suggest the use of an additional element in the toner composition that is an acid or base, present in an amount to effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Diamond and Weiss is a handbook that teaches the use of conventional materials for liquid toners, including the use of charge directors. This reference thus clearly describes only the use of a charge director to impart a charge on the particle, and does not teach or suggest the use of an element in addition to a charge director that is a charge control adjuvant that is an acid or a base present in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Thus, even in combination, the Kosel and the Diamond and Weiss references both teach the use of charge directors to impart a charge to toner particles, and individually and in combination fail teach the use of a charge control adjuvant that is an acid or a base present in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Claims 1-5, 10-13, and 16-20 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Qian et al. in US Patent Application Publication 2004/0091807 or Qian et al. in US Patent Application Publication 2004/0091808 or Qian et al. US Patent Application Publication 2004/0091809 in view of *Handbook of Imaging Materials* to Diamond & Weiss (eds.) New York: Marcel-Dekker, Inc. (11/2001) pp. 242-247, 254-257.

Each of the Qian references describes liquid toner compositions comprising particles made incorporating amphipathic copolymers. The copolymers of Qian '807 comprise soluble high Tg monomers, the copolymers of Qian '808 comprise crystallizable moieties, and the copolymers of Qian '809 have a Tg greater than 55°C at the D material portion thereof. These toner compositions use conventional charge director chemistry as discussed above, and, as acknowledged in the Office Action, do not use a distinctly separate charge control adjuvant that is an acid or a base present in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

As discussed above, the Diamond and Weiss handbook teaches only the use of conventional materials for liquid toners, including the use of charge directors. This reference does not teach or suggest the use of an element in addition to a charge director that is a charge control adjuvant that is an acid or a base present in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Because none of the above cited references teach or suggest the concept of a charge control adjuvant that is an acid or a base in a liquid toner composition in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations, the combination of these references do not render the present claims obvious.

Claims 1-5, 10-13, and 16-20 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Morrison et al in US Patent Application Publication 2003/0134940 in view of *Handbook of Imaging Materials* to Diamond & Weiss (eds.) New York: Marcel-Dekker, Inc. (11/2001) pp. 242-247, 254-257.

As noted in the outstanding Office Action, Morrison discloses a liquid ink for electrophotographic development containing a carrier, a graft copolymer, a positive and negative charge director and a colorant. Morrison does not disclose the addition of the acids or bases of the instant claims.

As discussed above, the Diamond and Weiss handbook teaches only the use of conventional materials for liquid toners, including the use of charge directors. This reference does not teach or suggest the use of an element in addition to a charge director that is a charge control adjuvant that is an acid or a base present in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Because neither of the above cited references teach or suggest the concept of a charge control adjuvant that is an acid or a base in a liquid toner composition in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations, the combination of these references does not render the present claims obvious.

Double Patenting

Claims 1-20 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-21 of copending Application No. 10/676371 in view of *Handbook of Imaging Materials* to Diamond & Weiss (eds.) New York: Marcel-Dekker, Inc. (11/2001) pp. 242-247, 254-257.

In order to overcome this provisional rejection and to expedite prosecution, a terminal disclaimer in view of copending Application No. 10/676371 is enclosed without prejudice.

CONCLUSION

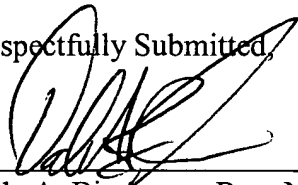
In view of the above remarks, it is respectfully submitted that the foregoing is fully responsive to the outstanding Office action. In the event that a phone conference between the

Examiner and the Applicant's undersigned attorney would help resolve any issues in the application, the Examiner is invited to contact said attorney at (651) 275-9811.

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Respectfully Submitted,

By: _____


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